

## CASE STUDY ON SOLID WASTE MANAGEMENT AND DISPOSAL USING REMOTE SENSING AND GIS OF BANGALORE SOUTH AREAS

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**Abstract** - *In developing nations, the amount of solid waste is rapidly rising. This is mostly because to the shift in people's lifestyles, urbanization, and countrywide population expansion. The solid waste, which is increasing today, is very difficult to control. The disposal and transportation of solid waste are the most crucial steps. The primary goal of this project is to use remote sensing and a geographic information system to locate an appropriate site or location for the disposal of solid waste (GIS). The location chosen for the disposal of solid waste should be both acceptable to the general public and environmentally sound. Due to human activity, the amount of solid waste may differ from one ward to another. The amount of solid waste is rapidly increasing in developing countries. The main reason for this is, due to the new lifestyle of the people, urbanization and increase in the population growth of the country. It is very to manage the solid waste which is increasing now-a- day. The most important thing is the , disposal and transportation of the solid waste. The main objective of this project is to find the suitable site or location for the disposal of solid waste using Remote Sensing and Geographical Information System (GIS). The site selected for the disposal of solid waste should be environmental suitable and should be public acceptable. The amount of solid waste may vary from one ward to another ward due to human activities. In order to protect the surrounding environment, the problem of solid waste must be solved and human activities should be controlled. This can be done in co-operation between the government, local authorities, and the local community around the area.*

**Key Words:** Urbanisation, Population growth, Solid Waste, Remote Sensing, Geographical Information System (GIS).

### 1.INTRODUCTION

Wastes are the materials that are developed due to human activities, which makes a severe impact on surrounding environment and also on human health. Solid waste includes non- liquid products such as those from households, municipal, supermarkets and construction sites, etc. Solid waste has been the biggest problem in both developed and developing countries (UNEP,2005; United Nation,2017). The amount of solid waste is increasing due to the increase in human population in developing countries and their activities. Therefore, it is essential to find out suitable solid waste management and disposal methods (Ahmed and Surya Bhagavan, 2021).

Solid waste creates various problems on human health. Increasing population, instantaneous economic growth, change in standard of living has quicken up the production of solid waste across the world (Elmira et al., 2010; Herring, 2010). The main aim of solid waste management is to collect, treat and dispose the waste in the suitable location. As a result, due to lacking of solid waste management system increases in disease transmission, pollute the ground and surface water, create green house gas emissions, harm the ecosystem services, disconsolate tourism and other business activities (Birara Endalew and Kassahun Tassie, 2018).

In recent years, Geographical Information System (GIS) has been playing a very vital role in the process of decision making. The main advantage of using GIS in the site selection process is that by using GIS time and cost can be saved. It also gives the digital data inventory for long term monitoring of the site (Ahmed and Suryabhagavan, 2021). Using Remote Sensing use can get the information's regarding various spatial criteria such as land-use/land-cover. GIS can operate, create and attribute information for selection of solid waste site. The site selected for the disposal of solid waste must be away from the town or

city, far from the water bodies because the water bodies may get contaminated, there should be a suitable road facility for the transportation of solid waste, the land selected should not have any mud cracks.

## 1.2 USE OF GIS IN SOLID WASTE MANAGEMENT AND DISPOSAL

GIS along with Remote sensing has been extensively deployed in waste management studies. Data captured from aerial photography, videography, and optical, thermal, microwave or LiDAR sensors is integrated with attribute and layers of prerequisite information which could make it easy to understand the area's waste generation nature and trend. These trends are useful while planning waste management and provide remedies while dealing with such severe environment issue. This technique is used to generate optimal route for collecting solid waste. GIS is a tool that not only reduces time and cost of the site selection, but also provide asset management services for future monitoring program of the site. Moreover, GIS information can be related spatially, exchanged, compared, evaluated, and processed with a very good flexibility.

## 1.3 OBJECTIVES

1. The main objective of the project is to select the most appropriate suitable site for solid waste disposal using Remote Sensing and Geographical Information System (GIS).
2. To study the present steps involved in the collection transportation and disposal of solid waste in the study area.
3. To avoid the illegal disposal via vehicles are avoided by using Remote Sensing and Global Positioning System (GPS).

## 2. LITERATURE REVIEW

Duguma Erasu et. Al., [1] Efficient municipality to be formed. New and effective strategies to be implemented. Create public

awareness and importance of their involvement in cleanliness drive.

Joel R. Kinobe, et. Al., [2] Implement efficient of waste collection methods and proper functioning of existing waste collection systems. Strict action in proper disposal of municipal wastes. Dedicated sites for disposal might avoid problems of illegal dumping in open areas.

Ajay Singh [3] Out of all the methods implemented, optimization models are proved to be effective. Ecological effects must be considered before implementing any policy for waste disposal. GIS can be used to track waste bins and proper functioning of the vehicles that collects waste.

M. Irfan Yesilnacar, et. Al., [4] Current factors such as rapid urbanization must be considered. When considering site for landfill, the site must be suitable and take factors such as public health, hygiene, public reactions, noise, dust etc. GIS with MCDA (multi-criteria decision analysis) can produce effective results by considering the above factors.

Ahmed Musa & K. V. Surya Bhagavan [5] Identify suitable land disposal sites keeping in mind, it has to avoid environmental problems. The shifted site must be easy to dispose and travel time should be less. As these must be cost effective methods in underdeveloped /developing city. Municipality must consider awareness to public in terms of recycling and reuse.

Rajkumar Joshi & Sirajuddin Ahmed [6] Public awareness to segregate the waste into biodegradable, inert and recyclable materials.

Initially composting plants will reduce the weight on the municipality for collection and transportation of wastes. Zone wise collected of waste is recommended for metro polytan cities.

Birara Endalew & Kassahun Tessie [7] Proper municipality to be formed which must also be effective. More effectiveness, more people will be satisfied with the outcome, hence the percentage of payers will increase from 22%. The municipality must strictly provide and track solid waste management services as promised. Effective monitoring and evaluation of services must be implemented.

Michel Soto Chalhoub[8] Public awareness to avoid waste to more extent created. Strict public policies must be implemented and maintained.

Kassahun Tessie & Birara Endalew [10] The pay for disposal method should not be high as it can lead to illegal dumping and it maximizes the cost recovery. Low payment and effective provision in the waste management service can increase the willingness to pay. The municipality must keep in mind, the education levels income and quantity generated per week to fix an amount so that the public will pay accordingly.

Junaid Qadir, Perminder Singh [11] Municipality must form a body to treat sewage waste from lake houses for clear water/water transparency. Proper monitoring can also reduce threat to ecosystem.

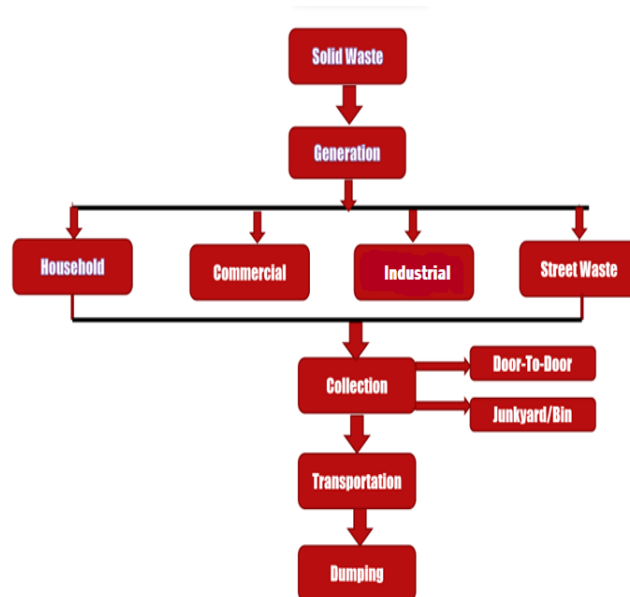
K. M. Elsheekh, et. Al.,[12] Solid waste management plans must consider and set goals to improve quality of life and health in cities. It must also be favorable by providing work by supporting industrialization and innovation.

Dipanjali Majumdar & Anjali Srivastava[13] The dumpsite emissions are particularly harmful for the health of the workers and the surrounding environment. Thus, regular health check-up must be done for the workers.

Bibi Ilmas, et. Al.,[14] This study can be useful for the baseline for policy makers to develop a waste management solution for the study area.

Taieb Waf, et. Al.,[15] It is important to point out that it is possible to use new generation bacteria for the processing of plastic waste. This is useful for the decomposition of waste from the wood industry.

### 3.METHADODOLOGY



### 4.CONCLUSION

The generation of solid waste has expanded extensively amid the ongoing past because of the rising worldwide population and rapid urbanization and its improper disposal and poor management in Bangalore south areas. The purpose of this study is to provide suitable site for the disposal of solid waste using GIS and remote sensing, without any harm to the surrounding environment and the public. Also study the present situation of the landfill site and the problems faced by the surrounding environment. Hence, it is advisable that before resorting to the landfill option, town and city administrations should consider waste minimization through recycling and reuse, and waste transformation alternatives.

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